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ABSTRACT

This paper consists of two major sections, an address on development planning in developing nations and a discussion of the issues raised in the address by the speaker and individuals from several developing nations. The address was given by Dr. Thorkil Kristensen, Secretary General of the Organisation for Economic Cooperation and Development and a former professor of economics. In his address, Dr. Kristensen examines the process of economic development and discusses various steps developing nations can take to speed their development. He suggests that developing nations must attract both physical capital and knowledge to increase the productivity of their land and labor force. Knowledge is more desirable than physical capital, he argues, because it multiplies faster and because a knowledgeable labor force tends to attract physical capital. Therefore, developing nations should strive to import as much knowledge as possible from more developed countries and should take steps to prevent a "brain drain" caused by migration of their own knowledgeable people to richer, more developed countries. (JG)

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The Fundamentals of Educational Planning: Lecture - Discussion Series

No. 29 THE BRAIN DRAIN AND DEVELOPMENT PLANNING

by Thorkil Kristensen

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THE BRAIN DRAIN AND DEVELOPMENT PLANNING

by

Thorkil Kristensen
Secretary-General O.E.C.D.

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INTRODUCTION (Mr. Philip H. Coombs, Director, I.I.E.P.).

It is a great pleasure to welcome Dr. Kristensen - our near neighbour and good friend - to the Institute.

If he will not object, I shall tell you a little anecdote to illustrate his interest in and his contribution to the economics of education. In the summer of 1960, when economists were just getting interested in the economics of education, there was a seminar on this subject at Bellagio, Italy, attended by a number of economists and educators, including Dr. Kristensen. About the third day, just after Dr. Kristensen had delivered an excellent statement about the contribution which education makes to economic growth (citing examples in various countries), he received a call from Paris informing him that he had just been elected Secretary-General of the Organization for Economic Co-operation here in Paris, which was shortly to broaden its membership and become the OECD. The next morning, therefore, he had to leave the seminar prematurely for Paris, and, to commemorate the occasion, we had champagne at the morning coffee break. We all knew from the experience of that seminar that the OECD, headed by Dr. Kristensen, would make important contributions with respect to the economics of education and educational planning, which it proceeded to do.

Dr. Kristensen has a very diversified and distinguished career. He was Professor of Economics in Denmark, a member of the Danish Parliament and Finance Minister, a member of the Consultative Assembly of the Council of Europe, and a member of the Danish Academy of Technical Sciences. Since 1960 he has been the Secretary-General of the OECD.

He is here today in his old role, not as head of OECD, but as a professor talking on a subject which interests him and all of us. The development process around the world, as we know, has had many significant side effects, one of them being the "brain drain." We are fortunate this afternoon in having Dr. Kristensen give us his prospective on this problem.

ADDRESS GIVEN BY DR. KRISTENSEN

The subject I shall deal with has been discussed much in public recently, but as far as I know it has not been studied very much in a systematic way and even the facts about it are only known to a very limited extent. We know there are movements of competent people across the frontiers and there is a general feeling that quite a lot of this movement goes from poorer countries to richer countries and could therefore be harmful to the development of the former countries. As there are no really good statistics on the flows in both directions and on the backflows we are at a very early stage of studying a very important problem. This being so, my remarks will of course have to be to some extent of a general character and I would like to see the problem of the brain drain as part and parcel of the general problem of economic development.

I would therefore like to say at the beginning a few words about the nature of development and the process of development as I see it. Development is a very complicated process. In fact, it is a profound transformation of the whole of society, but, looked at from a purely quantitatively economic point of view, it means of course simply growth of production: and therefore development is measured normally by the annual growth of the Gross National Product. Production again depends of course on the availability of productive resources or factors of production. I shall distinguish between four factors of production: land, labour, capital and knowledge. Any such grouping of the factors of production in categories is, of course, to some extent arbitrary. But I think the grouping I have indicated might be suitable for our purpose.

Now land (by that I mean all the natural resources in the soil and below) and labour are the original factors of production. They exist even in the most primitive societies. The more a society develops, the more capital and knowledge are added to land and labour. Therefore one could even say, in a quantitative way, that the process of development consists in adding more and more capital and knowledge per head of population. Talking about the brain drain, I am of course particularly interested in the factor that I call knowledge and I shall therefore make a few remarks about this phenomenon as a factor of production.

The first question is of course: is there any reason for distinguishing knowledge from, say, capital? You sometimes can see knowledge described as a sort of intellectual capital as distinct from physical capital in the form of machinery, ships, buildings and so on. It is quite clear that there are some similarities between physical capital and the factor that I call knowledge, but there are also some differences. Let me first look at the similarities. Both physical capital and knowledge are the results of human efforts. Land and labour are just there as soon as you have a country with a population. But it takes an effort to create capital and to create knowledge. One could say

that they are themselves a result of a production process and therefore there are considerations regarding cost of production connected with both physical capital and knowledge. In this way they are similar to one another. They also resemble one another insofar as the supply of both capital and knowledge in a country depends partly on home production and partly on imports and exports; and, of course, the brain drain means either import or export of knowledge. They are also similar in that both physical capital and knowledge increase the productivity of land and labour. One could say in a more general way that each of the four factors increases the productivity of the three others. The more capital you have the better use you can make of existing land and labour and even of knowledge because, to a large extent, the conditions for utilizing knowledge are that you have the physical capital with which competent people can work. On the other hand, if you have increasing knowledge the productivity of both land, labour and physical capital will become higher. These are some of the similarities between physical capital and knowledge.

But there are also differences and the most fundamental difference is that knowledge is a quality in man, in human beings. Capital consists of physical things, machines, ships, buildings and so on, but knowledge is a quality in human beings and cannot be separated from human beings. This, of course, is a very important thing because it has a number of consequences that I shall deal with. It means, among other things, that imports and exports of knowledge are very closely linked with migration of people which is not necessarily the case to the same extent with physical capital.

Another characteristic of knowledge as compared with physical capital is that knowledge has, so to speak, two dimensions. If you were to make an inventory of the knowledge existing in a country, it would consist of the number of facts known - multiplied by the number of people who know them. This has again a very interesting consequence concerning what I would call the production of knowledge. Production, too, has, if I may say so, two dimensions or two aspects - or goes in two directions. You can increase the number of facts known (that is what happens when you are doing research or gaining practical experience as a manager or a technician). Or you can increase the number of people who know certain facts. (That is what is done in the process of education and information). If you want a sort of geometrical description of the two dimensions, one could perhaps say that increasing the number of facts through research and experience is a vertical extension of knowledge whereas the increase in the number of people who knows certain facts is extending knowledge in the horizontal direction.

There is this interesting fact about the horizontal extension of knowledge that, distinct from the other three factors of production, knowledge can be extended by multiplication. If a man has a certain knowledge and he tells it to one hundred other people, the quantity of knowledge is thereby certainly multiplied by one hundred. No other factor of production can multiply that easily and this is, if I may say so, one of the most encouraging aspects of the production factor that we call knowledge: that it can multiply. Sometimes it has an ingrown tendency to multiply. You can, of course, also make an effort to multiply it. This is, by the way, one of the main means of making developing countries profit from the research and experience of more developed societies. I think, in fact, the tendency of knowledge to spread and the efforts made to make knowledge spread is the most important aspect of development and is the strongest factor that, in the longer run, will work towards some equalization of economic levels throughout the world, so much more so as knowledge, to a large extent, has the capacity of attracting capital.

Capital can be attracted to developing countries because there may be undeveloped natural resources, as in the oil countries and other countries where there are mineral resources. It can also be attracted by cheap labour, but only if the labour force (especially the upper grades of it) and the leaders of the country have sufficient knowledge and experience to make it worthwhile trying to establish industries by investments from the richer countries. I therefore think, since it is likely that wage levels will remain low for many years to come in the developing countries compared with the developed countries, that an increasing quantity of knowledge will rapidly be able to increase the attractive force of developing countries (this is to attract the capital from the richer countries). This, I think, is one of the things one should have in mind in making development plans.

Now since my subject is the brain drain and development planning, let me say a few words about <u>development planning</u>, having of course the factor knowledge particularly in view. What are we doing when we are setting up a development plan? I think we are doing two things: (i) we are trying to find out how to get the best possible supply of factors of production; and (ii) how to get the best possible use of these factors of production. Now these two questions can of course not be separated from one another because, if you want to know what would be the best possible supply of factors of production, you must have some ideas about what you would use these factors of production for if you had them. Therefore what a planner does, in fact, is to consider both what possibilities he has for getting through the planning period such and such quantities of such and such factors of production and what uses could be made of various combinations of factors of production.

There is a certain choice in both respects. A country can acquire more physical capital of various kinds and less knowledge - or the other way around - when it considers what to use its own foreign exchange for and what to ask for in the field of development aid. It can, of course, use various combinations of capital and knowledge for various productive purposes. So, in fact, these are the two questions a development planner must have in mind. And since we are concerning ourselves with the knowledge factor the question is, of course, mainly what are the considerations concerning the possibilities of acquiring more knowledge, in what forms could it be acquired and what would it be used for - if we had it.

Now this supply of knowledge - as well as of any other factor of production - can roughly speaking be said to depend partly on what I would call the forces of the market and partly on deliberate government policies. I should look first at the forces of the market and their influence on the supply of knowledge. The forces of the market, normally called demand and supply, of course in fact mean demand and the possibilities of meeting these demands, either by the resources of the country itself or by imports. Concerning the production of knowledge, meeting the demand for knowledge by the resources of the country itself, there is of course a wide disparity between the richer and the poorer countries. The richer countries, because they have had a long experience and development behind them, are much more richly endowed with all the resources necessary for the production of knowledge.

Imports and exports are, to a large extent of course, guided by demand. As long as we talk about the forces of the market and do not consider government policies we can, in a general way, say that those factors of production that are able to move are inclined to move toward the areas where they command the highest price. And this of course leads to competition between countries in attracting capital and knowledge - knowledge in particular - and of course in particular the competition between industrial countries, on the one hand, and developing countries on the other.

Now if we go back to the four factors of production that I have mentioned, it is evident that, in the developing countries, there is a much more evident shortage of both capital and knowledge than in the rich countries. Therefore one would, at first hand, expect that capital and knowledge would also command a higher price in developing countries and therefore be attracted to these countries. This does happen to some extent. It happens more automatically in the case of capital than in the case of knowledge and it has to do with the fact that I have already mentioned, namely that capital consists of physical things, but knowledge is a quality in human beings and movement of knowledge is therefore closely linked to movement of human beings.

When I said that one would expect capital and knowledge to command a relatively high price in developing countries because they are so short in these countries - short in comparison with the supply of land and labour - this actually is true normally of the price of capital (i.e. the rate of interest). In a normal economic situation, the rate of interest is higher in developing countries than it is in the industrialized, high income countries. And this of course is one of the factors that actually makes capital move to some extent towards the developing countries. It must be added, of course, that when you talk about the price, you should add an element of that price, namely the element of security. If we say that the interest I can expect on my capital is seven or eight per cent, we must normally add that this is what I hoped for, but something could happen that might make it impossible to get what I had expected. And there one can say that, though the price of capital is normally higher in developing countries than in industrial countries, security on the whole is at a lower level and this is one of the reasons why capital does not flow in larger amounts to the developing countries than it actually does. It even leads to some capital movement in the opposite direction. It is well known that rich people in developing countries sometimes send their capital to New York or to banks in Switzerland because they think that there is more security there than at home.

Now concerning the knowledge factor, one would expect, as I said, that the price would be higher in developing countries because, if capital is short in these countries, so is knowledge and sometimes knowledge even more than capital. On the other hand the factor of security, of course, also has some importance for the movement of knowledge, that is the movement of knowledgeable people. It probably means less on the whole than in the case of the capital factor, but it is difficult to tell. However the price that knowledge can command is a more complicated thing than the price of capital which is simply the rate of interest or the rate of profit you can expect.

The remuneration of knowledge in the form of remuneration of human beings' real knowledge cannot be measured simply by the income you can obtain. It must also be measured by something that I would call <u>the environment</u>. If I have a certain income, this is not a full description of my conditions of life. I might be happier with a slightly smaller income in country B than with a somewhat higher income in country A if the environment is more agreeable to me for various reasons in country B than in country A. We must therefore, when we consider the forces of the market concerning knowledge, look separately at the price in itself (that is the income level one can expect) and at the environment.

Now concerning the income level - we would, as I said, expect that knowledgeable people would command a high price. However, there you meet a fundamental difficulty which is this: the general income level in a developing country is, as we all know, much lower than in the industrial countries. If 'experts' or knowledgeable people are to command a higher price it means that they must have a much higher income than ordinary people in the country in question.

Here we have one of the difficulties which I shall illustrate by a few figures that I have taken from a paper that Sir Arthur Lewis submitted to an O.E.C.D. conference in Washington seven years ago. According to his figures, if you put the average income level for the population as a whole at 1, in the United States a primary school teacher would have an income of 1 1/2 but in Jamaica of 3 (that is three times the average level of income) and in Nigeria 7 times the average income. If you look at a secondary school teacher, his income would (in the United States) be twice the average income, in Jamaica 12 times, and in Nigeria 30 times. This reflects the fact that high quality manpower is much more mobile than ordinary manpower. Highly qualified people can move from the United States to Jamaica or to Nigeria, or to any other country, fairly easily (also the other way round, by the way). Ordinary people cannot move to the same extent. This means that the world market for highly qualified people is becoming more of a reality than it has been before because of the high mobility of highly qualified manpower. This again means that if a developing country wants to attract or to maintain highly qualified people, it must offer them an income that is many times higher than the average income level of the country (which of course is psychologically and politically a difficult thing to do). Here we have one of the sources of the brain drain.

But there is another reason that has to do with the environment. People with fairly good incomes, especially if they know about conditions of life and conditions of work in the rich countries, are accustomed not only to have a good income but also to have good possibilities for spending it. They are accustomed to having good possibilities for having their children in good schools, for having good hospitals in the neighbourhood, for having good and interesting working possibilities, for having good scientific institutes, if they are research workers, and so on. And it is no doubt one of the factors that makes scientists, engineers and technicians move to richer countries since there they can easily get access to a good hospital if they are ill, they can easily get good schools for their children, they can get good working conditions in scientific institutes and so on and so forth. This is important. I have seen in a paper (from your Institute, by the way) that there seems to be a higher tendency for privately financed students who go from developing countries to study in richer countries, to stay in these countries, than there is for publicly financed students. This is of course because

privately financed students normally go because they belong to a reasonably rich family and because they are accustomed to the kind of considerations that you would have in a rich family. Those who are publicly financed normally go because they are attracted by the perspectives of the development plans of their country. I shall come back to this later on. So much for the forces of the market for capital and for knowledge.

But before I leave the forces of the market, I must say a few words about one element in the economy where the movement of capital and of knowledge belongs to the same process. I am thinking of private foreign investment. If a European or American firm sets up a subsidiary factory in a developing country, this means the movement of capital, but it also means the movement of knowledge because the firm will have to send a number of technicians, managers, and so on to run the factory. It will normally also mean a certain production of knowledge in the developing country itself, because the firm in question will normally set up some training activity and maybe even some research activity in the developing country where it has a subsidiary. So it means not only a movement of knowledge with the movement of capital. It means, also, increasing possibilities for production of knowledge in the developing country itself. This is a particularly important aspect of foreign private investment and it has been estimated that the number of scientists and engineers and technicians that have come to developing countries through foreign private investment is not much smaller than the number that has come through purchase by the developing country itself, through technical and other foreign aid. So it is a very important thing.

And that brings me to my last subject: <u>policies designed to influence the flow of knowledge</u>. What should be the policies of a developing country? The first thing I would say is that you should as far as possible make the forces of the market your allies and not your enemies. The forces of the market are your allies when they lead foreign firms to invest in your country. Then they bring capital and knowledge at the same time. The forces of the market are your allies when the perspectives of the development planning of your country make the immigration to your country of competent people attractive and interesting. They are your enemies if the environment and the incomes that competent people can expect are better in other countries than in yours. The first thing I would say therefore is that I think, from the point of view of acquiring knowledge, it is very important to encourage foreign private investment. As I said, the rate of interest, or the rate of profit will often be high in developing countries. What makes foreign firms hesitate is often the feeling that there is not sufficient security. It will normally be a good policy to make that security as good as possible.

Concerning the more independent movement of people, it is, of course, a difficulty, as I said, that they must have much higher incomes than ordinary people in the country. Sometimes, if you get experts from abroad, you can get the country that supplies the expert either to pay their whole salary or to pay part of it so that you need not alter your whole budget (pay them such a spectacular salary compared with the average income of the country).

But I think that, concerning the possibility for attracting people, much attention should be given to the other element in their remuneration and that is what I call the environment. It is a very important thing to make the environment as attractive as you can. Now, it is of course not easy in a developing country to make the environment as interesting as it can be in various respects in Paris, in New York or in London. However, you can often do it in some specific fields and especially in some specific centres of the country. If, in your development planning, you find that you particularly need experts in a specific field, it will be a good thing if you can at least provide a good environment for them. It means, for example, having a university or a research institute where they can do the kind of work they are accustomed to do. It means showing them that, according to your development plan, there will be increasing possibilities for that kind of research, and there will be increasing need for that kind of research. I use again the word "perspectives" because, if you can show people who are highly competent research workers and so on, that there are wider perspectives in the efforts they might do in your country, I think they will often accept that the environment in various other respects is less perfect than it would be in Paris or New York.

Then there is one thing more I would in particular stress and that is what I know this institute is in the habit of calling <u>non-formal education</u>. I think it is particularly important that, in a developing country, you have the facilities for giving vocational training for those scientists, engineers and technicians at various levels, that can work on agriculture and on various other practical things that are of the highest priority for the next few years. And you there have the advantage that these forms of education must, by definition, be oriented towards the practical problems of the country in question. There are, therefore, many advantages in establishing such educational institutes in the country itself. In higher physics or mathematics the developing country cannot compete with France and still less with the United States; but it can in a number of fields, for example engage in research in agriculture and similar things where the research activity is directly oriented towards the practical problems of the country in question and that is one of the things that can make it attractive and interesting to work in a developing country.

Then, of course, it should be part of the policy of a developing country when it negotiates with industrial countries and with international agencies on development aid programmes to get such technical assistance as is really needed. Sometimes technical assistance and other assistance depends too much on the supply on the donor's side and too little on the needs of the recipient. It is very important that the recipient, in his formulation of a development plan, should find out what really are the needs.

This brings me to my very last point and that is that I must again come back to the word "perspectives." I think the developing countries will be facing many difficulties in the near future because of rapid population growth and because of rapidly increasing indebtedness and so on. Let me be frank and say it is partly because of a not too brilliant performance of the donor countries concerning development aid. I do believe, however, that the long term perspectives of developing countries are more promising than it is often supposed. This, of course, is on the assumption that the difficulties in the next one, two or three decades do not hamper further growth too much. I think, in fact, we are facing a period of particular importance. If I think there are wider possibilities in the longer run than it is often thought, it is exactly because I think the knowledge factor, by virtue of its capacity to multiply, is able to spread over the world. It will spread to a large extent by the forces of the market. It can be made to spread even more by appropriate policies. Now, you must have the needs of tomorrow in view. You should at the same time not forget the long term possibilities. How can we combine these two things in development planning? How can we maintain the wider perspectives of the longer term future while looking at the urgent needs of the immediate future?

This brings me to the question: is it agriculture or industry you should focus on? I think it is agriculture tomorrow, but it is industry in the longer run. It is agriculture in the near future because of the increasing food imports by many developing countries. But it is industry in the longer run because it is industry that has made the industrial countries rich and it is by industrialization that the developing countries can become, in their turn, industrial countries and therefore richer countries. Now you can combine these two things. Let us focus our attention on those activities supporting agriculture that are of an industrial nature. For what does it mean to help agriculture? It means fertilizers, it means irrigation, it means machinery and implements for irrigation, it means better tools for tilling the soil, it means pesticides, it means store houses, transport facilities and so on. Therefore, to a large extent the development of agriculture depends on the development of what is often called the agro-allied industries. Therefore you can serve the immediate need of agriculture and the future needs of an industrial development at the same time in focusing attention on agro-allied industries. Furthermore, since agriculture in developing countries is to a large extent a seasonal activity, there will be an idle labour force for long periods of the year. One of the things that has made Japanese development so successful is that village industries have played a large role in the development of Japan. If you can

establish light industries in the villages, you can utilize the labour force that is not fully utilized in agriculture and there again you have a beginning of industrial development. If you can, in your development plan, show that these are the perspectives, that you are looking at the needs of the immediate future, that at the same time and by the very efforts you are making in view of tomorrow's needs, you are also looking at the longer term perspectives, then I think you will help create the environment that will be attractive for the rapidly increasing number of competent people, both in developing and developed countries, who think that the process of development is a very difficult thing, but one of the most fascinating tasks that exist. Thank you.

Mr. Coombs

Thank you very much, Dr. Kristensen.

Starting with the title of the brain drain, you have covered an enormous range of fascinating problems, very lucidly. I hope that you will have a little time now to engage in our customary dialogue that follows these presentations.

One of the points which you did not touch directly upon in explaining the international flows of knowledge incorporated in human beings, was the problem of job opportunities per se. It appears that a number of the developing countries are running into a situation where they have succeeded in expanding the output of educated personnel, including high level personnel in certain skilled areas, but their economy, for various reasons, is unable to absorb this increased output of manpower rapidly enough. Thus, apparent "surpluses" of educated manpower begin to show up, first at the primary school leaver level, then later at the secondary level and finally at the university level. Initially arts and law graduates come into relative abundance, but ultimately, if one takes the case of India today, even engineers (who have been thought to be the scarcest category of all) appear to have trouble finding jobs. Do you have any advice to educational planners on what might be done to bring the output of education and the absorbability of the economy into balance? One suspects that the absence of appropriate job opportunities in some developing countries may foster the brain drain more than the differences in salaries you mentioned. My impression is that a man will frequently prefer to go back to his own country with his newly acquired skill, even at a much lower salary if there is an appropriate job for him. But without such a job available, it is difficult to get him home.

Dr. Kristensen

Well, I think if his job isn't there, it means that the man's education has not been in conformity with the country's needs and this, of course, means that it is a very difficult, but very important thing to find out what the needs are. The needs may not be so much for engineers as for, say, middle level technicians. It may not be so much for scientists as for middle level assistants, for research workers or for extension workers in the villages. Now it is not easy to tell what the needs will be in ten or fifteen years' time. But hard work on this can help us at least to get a somewhat clearer picture than you would have if your thinking stops at: "the rich countries have higher schools, higher education and so on; we must have the same thing." I think one of the difficulties is that both parents and their children, for reasons of prestige, for reasons of what is agreeable, often look at the kinds of education that would be a natural thing in a rich country, but which are not the first priority in a developing country. It is psychologically a very difficult thing for a government to say: "secondary education and higher education in a general way are not our first priorities for the near future." Even to some extent, one could say: "full carrying through of primary education is not our first priority." Our first priority might be some adult education of an informal nature in various fields - that is educating for the jobs that exist. If you educate just to educate, the jobs may not be there.

Mr. Coombs

May I follow that up with a further question? What you have said in essence is that the educational system is turning out the wrong mix of people to fit the economic requirements, and certainly there is abundant evidence of imbalances in the composition of the educated personnel coming on to the market. But it would seem that there is another factor - that, even if an educational system were to adjust its output mix of manpower to fit what the manpower planners say the economy's growth requires, they may still not have jobs. One reason is that the theoretical manpower needs, as estimated by manpower projectors, may not coincide at all well with the actual employment <u>market demand</u>. In short, the market demand in these countries is not necessarily a good indicator of the real needs of the country in terms of how manpower should be allocated for optimum development. We are dealing here with highly imperfect markets where actual wages and salaries are not good reflectors of relative productivity, and where, to use your term, the incentive structure itself is your worst enemy. This structure of incentives may tend to allocate manpower precisely the wrong way so far as development needs are concerned. Thus, to get to the root of the difficulty, it is necessary to correct not only the pattern of educational output but also the pattern of the incentives in the market place. Is it not therefore, a problem not only for the educational planners but for the economic and manpower planners?

Dr. Kristensen

Let me say that in the case you are describing the system of incentives must be wrong. Then you have either to do something to change the incentives or you have to use, well "force" is a strong word, but to use other means of moving people and other resources than simply the factors of the market. This can of course be done to some extent. What I said about the environment was of course, in fact, something that had to deal with a system of incentives. Now this may be a fairly easy thing to do for a small number of research workers in a specific field. It can, of course, to some extent, be done also in a wider field. We must take the market as it is or we must change the market mechanism. And therefore I think, to a large extent, it is a question of having the right system of incentives.

May I once more come back to the word "perspectives" ? I wonder whether, on the whole, it is known to the population and even the more educated part of the population of a developing country what the perspectives of the country in question are. What can be expected to happen over the next ten, twenty or thirty years in that country ? Do people know that ? I doubt it. And I think it is part of a planning process to make the picture alive for the population, to show what the perspectives are and by that means influence the system of incentives. That, of course, is a very incomplete explanation, but I think that, as long as you have not done that, you cannot really say that you are turning out the right people because if the mechanism is not there to make use of the people you are turning out, then they are not the right people. They would be the right people if the system of incentives was the right system. But either you have to change the system of incentives or you have to change the mix of educational production.

Mr. Tinkorang (GHANA)

Concerning incentives for the future, Dr. Kristensen said that, in his view, it will be agriculture tomorrow and industry in the long run. Now from what we know at the moment, the agricultural products from developing countries have not been commanding as high a price as they used to do and it is because of this that many of the developing countries are becoming more and more indebted to the advanced countries. Now, if this trend continues, it follows that the amount of money they are likely to get from the sale of agricultural products will grow smaller and smaller, and that consequently, the developing countries will be unable even to maintain their educational services; this, of course, would affect the general development of the country. Now, if this is the case, is there any possibility of any of these developing countries embarking on any large scale industrialization programme since money required for such purposes is likely to be extremely scarce, and, since the prices of schools provided by the advanced countries continue to rise, whilst the price of agricultural products from the developing countries continues to fall ?

Dr. Kristensen

That's a good question.

I think the situation you are describing is typical of some developing countries, including, of course, your own, but I don't think it is typical of the majority of developing countries and especially not of the majority of people who live in the developing countries. If you think of countries like India, Pakistan, United Arab Republic, Brazil, and so on, they are more and more becoming importers of food (i.e. of agricultural products) because their own production is too small. Now, of course, a number of developing countries such as Ghana, and other cocoa-producing countries (also a few sugar producers) have the difficulties you describe. There, I think, a large scale industrialization is probably not possible, but it has become urgent to have some diversification and to begin industrialization now. In the large food importing countries I think more can be done to develop agricultural production and there, in fact, prices have been rising in the last few years. For example, food prices in India have been rising fast; the same is true in other food importing countries. Of course, to a large extent, I had in mind the largest countries (those with the greatest population), but if a country is dependent on one of those agricultural products (or raw materials, for that matter) for which the market is weak, then diversification is, of course, an urgent need that needs capital from outside, from the World Bank and donor countries.

Mr. El Sanousi (SUDAN)

I simply wish to ask a question concerning "agriculture first, and then industry for the future." Coming back to the first part of the lecture, it seems to me that it is the natural resources in the country that define the order of priorities. In a country like Saudi Arabia, for example, there is no chance for agriculture there, but there are now opportunities for mining and petroleum industries and perhaps further dependent industries. So it is not definite that we should focus first on agriculture and then think "tomorrow for industry". It is the natural resources that are in the country which define what action is to be taken.

Dr. Kristensen

Yes, I would, of course, agree with that. Now Saudi Arabia is fortunate in having enough foreign exchange for developing its natural resources and, of course, also for establishing industry. In the case of the Sudan, I suppose, that is a more complicated story. But if you have natural resources that could be developed, that should be sufficient to attract capital from the rich countries, of course.

Now it is, of course, clear that the development pattern will be different in the individual countries. I think, nevertheless, there are some possibilities for agriculture in all countries: they may be small in some; bigger in others. If I say that in the near future something should be done about this, it is not only because of the food needs of some countries. It is also because, in the field of industry, you can profit more from the foreign investment that I talked about than you can in the field of agriculture. In agriculture, you mostly have small farm holdings and it is a difficult process to bring modern techniques to the many small farmers spread around in the country. Therefore I think the public authorities in most countries have to do more to help agriculture than to help industry because, in the field of industry, you can rely to a large extent on resources coming automatically from abroad.

Mr. Coombs

Might I, in this connexion, turn once again to the question of the planning opportunities?

It is fine for a country such as Saudi Arabia or Libya, that is blessed with oil under its soil, to have a good foreign exchange position. But even if the country succeeds in developing petrochemical industries, which will build and diversify its economy, the problem still remains that those modern industries do not create many jobs. They are capital - and not labour - intensive industries. What is to become of the rest of the people who are not lucky enough to get one of these industrial jobs? Some eighty per cent or more of them are located in rural areas. They need jobs. They have a life to lead. If the country has good soil conditions, it may not necessarily be food that they should produce; this depends upon the situation. Perhaps, for example, they should produce cotton as a base for a textile industry or some other agricultural product tied to a processing industry. In any event - and I should like Dr. Kristensen's reaction to this proposition - the object of economic policy and planning should not be merely to make the statistics of gross national product move upward. An equally important objective must be to create those kinds of economic activities that will give all of the employable people in the country a chance of employment. Sometimes it may be necessary to compromise these two objectives somewhat, at least in the shorter run.

Dr. Kristensen

That of course is true. When I talked about village industries, I was, in fact, thinking of creating jobs for people who are not fully employed where they are. I think, to a large extent, developing countries should, in the near future, concentrate on labour-intensive industries. It so happens that I found on my table a study by Hal Lary on the exports of developing countries of labour-intensive manufactured products. (1) (I think it would interest this Institute. We co-operated, in the O.E.C.D., with Mr. Lary when he was making his study). It is an interesting fact, that, whereas, in general, exports of developing countries have expanded in a disappointing way, their exports of manufactured products, and in particular of labour-intensive manufactured products, have been growing relatively fast. They have been growing faster than the exports of industrial countries of the same products. And they are gaining an increasing part of the market in the rich countries. This will be even more so if we have a preferential system for their exports as we might have in some years' time. But I think it is, to a large extent, that kind of industry one should concentrate on. If I had had more time, I would, in my lecture, have talked about trying to find out what are appropriate techniques for industry in a country where there is an ample and cheap labour force. For we should, of course, not have the same techniques in the United States (where the average earnings per hour are very high) as in a developing country (where they are very low). The question of appropriate techniques and appropriate product mixes for industry in a developing country has to my mind not been studied as it should have been studied. Lary studies part of, but much more should be done.

Mr. Yusuf (SOMALIA)

At the moment the content of education in developing countries is often very much the same as that of highly industrialized nations. But a technician, for example, in an African country often has a much simpler job than his counterpart in, say, the United States. Thus, if training courses were shortened in developing countries and made more suitable to the actual needs of such countries, this would surely act as a brake on people wishing to move from one country to another.

(1) Hal B. Lary, Imports of Manufactures from Less Developed Countries, New York, London, Columbia University Press, 1968, 286 p. (National Bureau of Economic Research Publication).

Dr. Kristensen

Yes, I would think so. Training should be adjusted to the jobs there will be in the countries. There will, of course, always be a number of people who can afford to get a different kind of education by going to the richer countries and those you will probably lose anyway. This is a fact one has to accept for some time to come. As long as there are rich countries, or rich people in the poor countries, this will happen. You might tax some of their income away and that might counteract such a tendency. But I think it is a general fact that those who can study on their own account (paid for by their parents) will leave anyway, unless you can provide some very interesting jobs for them. This you can only do for a few high-level people. But I would think education in a developing country should, to a large extent, be directed towards these more modest jobs that are urgently needed and where education takes a shorter time.

Mr. Paiz Oliva (GUATEMALA)

May I make two brief comments?

There can be political reasons behind the brain drain of highly qualified manpower. In the case of Argentina a few years ago, some university professors had to leave their teaching posts and their country because the new Government was against their way of thinking.

I am also worried about the ever increasing economic gap between the industrialized countries and the developing countries. Will the poorer, developing countries ever catch up with the richer, advanced countries? I am sceptical.

Dr. Kristensen

When I talked about security for both capital and persons, I was of course to a large extent talking about political stability. There can be no doubt that political stability is one of the most important conditions for attracting capital and persons and for laying the foundations for solid economic expansion.

Now concerning the gap between the rich and the poor countries, it is true that, in a general way, it is widening now. But it is not so in all cases and I think, if you could distinguish between not two, but three categories of countries (the developed countries, the developing countries and those who are in the grey zone between them, those who are developing, but approaching the status of developed countries), you will find that it is this medium category that is growing fastest. For example, the countries in the O.E.C.D. that have had the fastest economic growth in recent years have been Japan (recently a developing country), Spain, Greece, Portugal and

Turkey. They are growing faster than the United States, France, Germany and Britain. Other countries in the same category are, for example, Mexico, Taiwan, and a few others. This means that, when a developing country has reached a certain stage in its development, it begins to reap the fruits of the efforts made at the earlier stages. Some of you will have heard of the theory of Professor Rostow of the so-called "take off" into self-sustained growth. I think he is over-simplifying things a bit, but there is something in it. If you put a boy or girl into a primary school this doesn't give you any increase in production for many years to come. But it may do in ten or twenty or thirty years. And a number of other things are done in the developing countries now which do not have much importance for their growth in the immediate future, but which are laying the foundations for growth later on. And my concern is that the indebtedness and the population growth in the next one or two decades will create so many difficulties that it takes a long time before countries really can begin to have the results of what they have been doing. Therefore I would hope that the richer countries could make an increased effort in the near future because I think a lot of things are being done which can eventually give the developing countries a higher growth rate than the rich countries. It is interesting to know that the growth rate per capita in European countries is normally higher than in the United States, that is to say, in spite of the famous technological gap, the income gap between the United States and Europe is for the time being narrowing - and Europe is under-developed compared with the United States.

Mr. Vivas Dorado (COLUMBIA)

What are the developing countries going to do during the critical period of twenty years or so before there is any increase in production? How are they going to solve their difficulties?

Dr. Kristensen

If I understood the question correctly, it was that difficulties are coming up now after a period during which there has been relatively satisfactory development, but this, of course, is something that happens in a number of countries. It can happen, for example, because of increasing indebtedness; it can happen because of a too rapid population growth. It can also happen that because sometimes the easiest things are done first, you get some quick results there. When you come to more complicated things, there would be difficulties. This is why I think Rostow's theory is over simplified. You cannot simply say that growth goes slowly for a long time, then suddenly it takes off and you become a developed country. It is more complex than that. We have seen in a country like Argentina that there was rapid growth during a period many years ago; then there was near stagnation for a long time. You've seen the same in Turkey. But now Turkey has a second period of rapid growth because more appropriate policies are applied. It is, of course, easy to say that. It is not easy to make avail

of it, but it is true that there is an immense intellectual capital of knowledge available in the world - a large number of important facts are known. They are not known to enough people. I think they are bound to be known to more through education and through information and therefore I think the possibilities are there. It takes patience. It is not easy to be patient if you are poor and if you know that other people are rich. But I think the experience of a number of countries that I have mentioned nevertheless shows that there are possibilities for narrowing gaps.

Mr. El Sanousi (SUDAN)

The subject of the brain drain has been dwelt upon by public opinion and in written material in many countries. In a small way my own country is suffering from it since the neighbouring countries recently discovered oil. Most of our educated people, especially the teachers, are being not only taken from the country when we need them - on the basis of cultural agreements - but also being given very inviting terms of service and remuneration. I should appreciate the lecturer's opinion on the brain drain problem all over the world. What data is now available and is any solution to the problem in sight?

Dr. Kristensen

Well, I have of course, tried to give some elements of answers in my lecture. It is a very complicated story and I do not think you can immediately turn the brain drain into a brain gain. We must accept the fact that, for a number of years to come, the brain drain will be an important thing. The kind of thing to do is, of course, to provide the conditions, the environment for at least a few competent people and then to show them what the perspectives of your country are. I read in the first issue of a new F.A.O. publication (called, I think, "F.A.O. Review") a story of an Indian scientist, a physicist who returns to India because he thinks there is interesting work to do. You cannot get many people returning to the Sudan immediately, but I think, if there is a development of oil and other resources, if you can devote some of your few resources and other things to creating the environment for a few of the people you need, it will have some influence over the years.

Mr. Perez (MEXICO)

This great flow of educated people, I think, shows us a great deficiency in our educational systems. Such people are very efficient in multiplying knowledge, but sometimes they are not very efficient in multiplying a very important social value, that is to say, social responsibility. Is the principal cause of this brain drain a lack of social responsibility on the part of the educated people, a lack of positive attitude when faced with problems of the country? If it is, what can educational systems do to correct this situation?

Dr. Kristensen

I think the brain drain is, to some extent, due to lack of social responsibility. If rich men's sons go to universities in the United States and stay there, it is, of course, because they can get better conditions there and they do not feel very responsible towards their own country. What you can do to strengthen that responsibility is, of course, a very difficult question to answer. I think education itself and good teachers can have an effect. I think again that by pointing out the perspectives and the dangers of the country, you would help increase this social responsibility. I think that's all I can say, but it's of course a long story.